OPPOSITION TO RM-11392

Mr. Miller states that "historically, mode emmissions have been segregated to protect narrow band modes from interference". This is not correct. Narrow band modes are inherently more robust than wide band modes as is demonstrated by the advantages of CW over SSB or SSB over AM. If there was an intent to provide protection, it was to protect wide band modes from narrow band modes. Later in the same paragraph, Mr. Miller states that "it is also clear that the Commission intends to separate emission types". I don't believe that separation was a goal in itself but that it was an expedient tool used to mitigate interference problems between "inharmonious" modes. As Mr. Miller noted, the Commission stated "It is appropriate to avoid, to the extent possible, placing in the rules detailed regulations and specifications for the configuration and operation of various amateur communications systems.". I believe the Commission would find it preferable to see the amateurs develop technical as opposed to administrative means to mitigate the problem. It seems that Mr. Miller would prefer to see the Commission hand down an administrative solution rather than work toward "an innovative technical solution" which would allow PACTOR III to function in a more "harmonious" manner alongside RTTY.

In paragraph 12, Mr. Miller says "PACTOR III does not analyze the amount or the presence of traffic in the spectrum". In an earlier part of the same paragraph, however, he says "When conditions are favorable, PACTOR III is designed to use speed level 6, and then as propagation conditions become more difficult, the algorithms cause a reduction in speed and also in bandwidth". His two statements, in the same paragraph, appear to be at odds with each other. PACTOR III is, indeed, sensitive to its environment and, to an extent, adjusts itself to fit in, only using wide bandwidth and high speed when conditions permit. PACTOR III is not "all-knowing" and probably uses its detected error rate as an indication of band conditions. It probably can not distinguish between QRN and QRM but adjusts itself properly in

both cases. PACTOR III does not start out at high speed when initiating a contact. It starts out at low speed and then, when contact is made, it interrogates the distant station to determine if it is PACTOR III compatible. Then, if it is compatible and if conditions are favorable, it starts increasing speed until it reaches speed level 6 or starts encountering errors. If the error rate is too high, it slows down. I would hazard to say that the PACTOR III is, in this regard, more responsive to conditions than many amateurs who "switch in the kilowatt" and leave it in whether it is needed or not. There are some good things to be said about automatic equipment.

Also in paragraph 12, Mr. Miller discusses spectral efficiency which he says is obtained by "dividing the occupied bandwidth by the usable data rate". In his table #1, describing the attributes of PACTOR III, however, he shows that at speed level 6 PACTOR III occupies 2200 Hz bandwidth, has a usable data rate of 2722.1 and has a spectral efficiency of 1.237318. When I divide the occupied bandwith (2200) by the usable data rate (2722.1), however, I get 0.808, not 1.237. Perhaps Mr. Miller should check his calculations. The same error shows up in table #2 describing PACTOR II. In the text, he says PACTOR II has a constant bandwidth of 500 hz. At 16 DPSK the usable data rate is 700. Dividing 500 by 700 results in 0.714. Mr. Miller's result was 1.4. Mr. Miller uses this erroneous information to make his case that PACTOR III is an inefficient user of our spectrum. If his calculations are in error, then I maintain that his conclusions are also in error.

I suspect that Mr. Miller's error may have been due to the equation he was using. Data rate times time divided by bandwidth would yield a measure of total throughput over a specified period of time. If time were made equal to 1 second, the equation would simplify to data rate divided by bandwidth, which is the inverse of Mr. Miller's equation. If the data rate were expressed in bits/second and bandwidth in cycles per second, the expression would simplify to bits/cycle of bandwidth. The higher the number, the more efficient the mode.

RTTY commonly runs at 45 baud (bits/second) and occupies about 200 hz of bandwidth. Spectral efficiency would then be 45/200 or 0.23. Mr. Miller's figures show PACTOR III running at speed level 6 has a usable data rate of 2722.1 bits/second and an occupied bandwidth of 2200 hz. Using his figures, PACTOR III would have an efficiency of 2722.1/2200 or 1.24, a higher spectral efficiency rating than RTTY. There are many reasons this might be so, not the least of which is that the PACTOR III mode uses, as Mr. Miller points out, the very latest in high technology.

The reasons for Mr. Miller's complaint and his conclusions are invalid. PACTOR III is becoming the backbone for the ARRL's National Traffic System and there is a renewed interest in this very valuable public service. Emergency communications is one of the primary justifications for the existence of Amateur Radio and it would be a disservice to the country as a whole to change the rules in such a fassion as to relegate PACTOR III to the high end of the HF spectrum where most of its usefulness would be lost. This petition should be denied.

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